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|-------------------------------|------------------------|---------------------|--|
| Notice of Allowability | Application No. | Applicant(s) | |
| | 09/937,780 | MIHAN ET AL. | |
| | Examiner | Art Unit | |
| | Rip A. Lee | 1713 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to January 22, 2004.
2. ☒ The allowed claim(s) is/are 1, 2, 4, 5, 8-12 and 14-16.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

This office action follows a response filed on January 22, 2004. Applicants have amended claims 1, 2, 4, 8, and 9. Claims 3, 6, 7, and 13 were canceled.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jason D. Voight on March 31, 2004.

Claim 15, line 1 replace "1" with "11" such that claim 15 depends from claim 11

Claim 2, line 2 delete "from" as indicated

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance: Claims 1, 2, 4, 5, 8-12, and 14-16 are allowed over the closest references, JP 10-231317 to Tani *et al.*, WO 00/58319 to Maas *et al.*, WO 00/34211 to Jones *et al.*, and Koehn *et al.* (*Abstr. ACS*, 1997).

The present invention is drawn to a process for copolymerization of ethylene or propylene with one another or with other olefinically unsaturated compounds in which the polymerization is carried out in the presence of a group 4-12 transition metal complex containing one or two substituted or unsubstituted 1,3,5-triazacyclohexane ligands and one or more aluminoxanes. The process results in the formation of high molecular weight copolymer with narrow molecular weight distribution and high comonomer content, and this distinguishes the invention from the cited prior art.

Tani *et al.* teaches a process of olefin polymerization in the presence of a catalyst system comprising a chromium compound containing a substituted triazacyclohexane ligand and borane or borate activators. The invention encompasses polymerization of ethylene, propylene, butanes, as typical alpha olefins, but there is no showing of olefin copolymerization. As seen from the experimental results, the process results in the formation of oligomer only. Therefore, one having ordinary skill in the art would not have found it obvious to use this catalyst to make high molecular weight copolymer.

WO 00/58319 to Maas *et al.* teaches a process for oligomerization of olefins using a catalyst containing a chromium triazacyclohexane complex, LCrCl_3 .

WO 00/34211 to Jones *et al.* teaches a process for oligomerization of olefins using a substituted triazacyclohexane-chromium complex in which the principal product is C₈-C₃₆ α-olefin trimer.

Koehn *et al.* (*Abstr. ACS*, 1997) teaches a process for polymerization of ethylene in the presence of a catalyst comprising a *N*-substituted 1,3,5-triazacyclohexane (R₃TAC) chromium complex and methylalumoxane coactivator. The abstract does not describe the nature of the reaction product, and it does not disclose copolymerization of ethylene/propylene with each other or other α-olefin. In view of the preponderance of evidence furnished in the specification, and in view of the results established in the prior art, it is deemed that, even though the notion of copolymerization is not novel, copolymerization using the catalysts of the instant invention is an unexpected feature. In this regard, it would not have been obvious to one having ordinary skill in the art to establish the same experimental findings in view of the simple disclosure of Koehn *et al.* alone.


Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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March 31, 2004


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